BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Implement the Commission's Procurement Incentive Framework and to Examine the Integration of Greenhouse Gas Emissions Standards into Procurement Policies.	Rulemaking 06-04-009 (Filed April 13, 2006)

RESPONSE OF THE NATURAL RESOURCES DEFENSE COUNCIL (NRDC)
TO PETITION FOR MODIFICATION OF D.07-08-009
BY THE ENERGY PRODUCERS AND USERS COALITION

October 26, 2007

Audrey Chang
Natural Resources Defense Council
111 Sutter St., 20th Floor
San Francisco, CA 94104
415-875-6100
AChang@nrdc.org

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1. Introduction and Summary

In accordance with Rule 16.4 of the California Public Utilities Commission's (CPUC or Commission) Rules of Practice and Procedure, the Natural Resources Defense Council (NRDC) respectfully submits the following response to the petition for modification of Decision (D.) 07-08-009 (Decision) filed by the Energy Producers and Users Coalition (EPUC) on September 26, 2007. In accordance with Rule 16.4(f), which states that a response to petitions for modifications "must be filed within 30 days of the date that the petition was filed," this response is timely filed. NRDC is a non-profit membership organization with a long-standing interest in minimizing the societal costs of the reliable energy services that Californians demand.

NRDC continues to strongly support the Decision, which rejects the earlier petition for modification filed by the Energy Producers and Users Coalition and the Cogeneration Association of California (EPUC/CAC), as well as D.07-01-039, which adopted the rules for the greenhouse gas (GHG) emissions performance standard (EPS) required by Senate Bill (SB) 1368. EPUC's petition for modification is without merit, simply repeating previous arguments already rejected by the Commission, and we urge the Commission to deny the petition.

In arguing for modification of the cogeneration thermal crediting methodology, EPUC repeats its arguments that the methodology previously adopted by the Decision and by D.07-01-039 "does not fairly reflect the operating conditions of bottoming cycle plants" and that it "allocate[s] all of the emissions of the *industrial* process to the *electric* output of a bottoming cycle plant" (p. 1-2). EPUC maintains that the conversion formula is "infeasible" for bottoming-cycle cogeneration facilities (p. 2). Each of these arguments is without merit.

2. **EPUC's argument that the methodology for calculating a GHG emissions rate for bottoming-cycle cogeneration does not fairly reflect their operating conditions is without merit, and the issue of allocation of emissions to different processes is outside the scope of this proceeding. The Commission has already correctly found that the formula should be applied to bottoming-cycle cogeneration facilities.**

EPUC claims that application of the cogeneration thermal crediting methodology is unfair for bottoming cycle cogeneration, since the adopted formula would "allocate[s] all of the emissions of the *industrial* process to the *electric* output of a bottoming cycle plant" (p. 1-2). The issue of allocation of emissions to different processes is outside the scope of the Commission's charge to establish and enforce the EPS under SB 1368. The Commission's establishment and use of a thermal crediting methodology for cogeneration facilities is *only* for the purpose of determining compliance of a facility that generates electricity with the EPS and SB 1368, as D.07-01-039 already made explicitly clear in Conclusion of Law 34. The issue of how much emissions should be allocated to the electricity process versus the industrial process is more appropriately addressed in the context of implementing Assembly Bill (AB 32), the Global Warming Solutions Act, and is under consideration by the California Air Resources Board (CARB). Thus, NRDC supports the use of the cogeneration thermal crediting methodology to determine the compliance of bottoming cycle cogeneration facilities with the EPS, and NRDC strongly supports the Decision's Finding Findings of Fact 4-6.

3. **Contrary to EPUC's claims, the thermal energy crediting formula clarified by D.07-08-009 *can* indeed be applied to bottoming-cycle cogeneration facilities and thus should not be revised.**

EPUC claims that the clarification to the thermal energy crediting formula provided by the Decision is "nonsensical" (p. 3). However, EPUC's numerical calculation example illustrates a misunderstanding of the intent and application of the thermal energy crediting formula.

In describing what should go into the denominator of the GHG emissions rate calculation for bottoming-cycle cogeneration facilities, D.07-08-009 states, "The denominator of energy produced would consist of the kWh of electricity produced by the facility, plus a thermal credit (through the 3,413 Btu/kWh standard conversion factor) for the thermal energy produced by the industrial process that is used for electricity generation in the waste heat boiler" (p. 11). For reference, the following is the formula adopted by D.07-01-039 to calculate the net emissions rate associated with cogeneration facilities:

$$\frac{\text{TOTAL GHG EMISSIONS FROM COGENERATION FACILITY}}{\text{KWH ELECTRICITY} + \text{BTU THERMAL ENERGY (expressed in kWh)}}$$
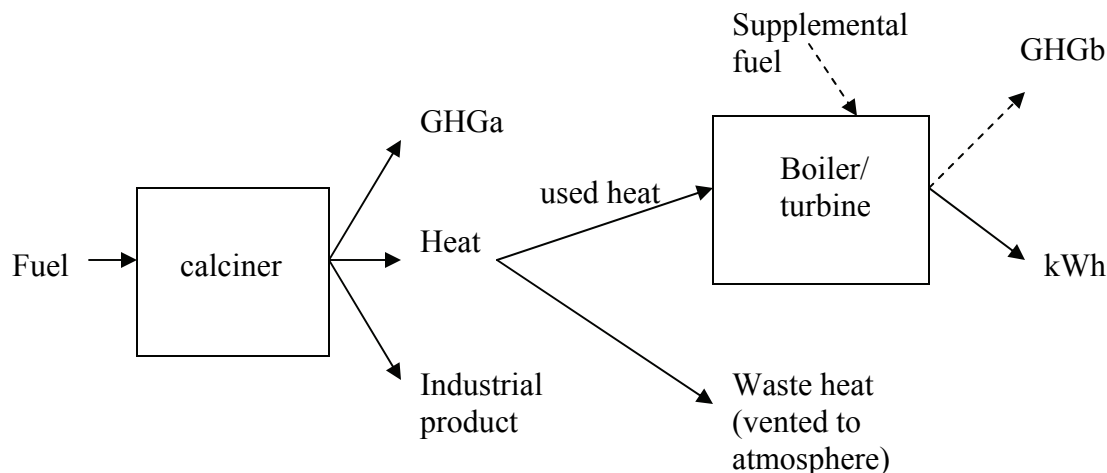
The intent of the 3413 Btu/kWh conversion factor is to convert thermal energy that is used (expressed in Btu) into the equivalent number of kWh, such that it can be added to the kWh of electricity produced by the facility. The reason why EPUC's calculations do not work is because they simply assume that the kWh generated by the facility is also the term for the thermal credit. In order to properly apply the formula and determine the thermal credit, however, one must first determine the amount of "the thermal energy produced by the industrial process that is used for electricity generation in the waste heat boiler," as directed by D.07-08-009 (p. 11). Once this thermal energy that is used for electricity generation (and not vented into the atmosphere and wasted) is determined in Btu, *then* the conversion factor can be used to convert this term into kWh.

Further, even if EPUC's assumed application of the formula was correct, EPUC seems to express surprise that their calculation of a GHG emissions rate would "fail to

meet the EPS" (p. 3). The purpose of applying this thermal crediting methodology for all cogeneration facilities is to credit the thermal energy used in a facility, *not* to ensure that all bottoming-cycle cogeneration facilities meet the EPS, as EPUC seems to imply. The amount of thermal crediting (and resultant GHG emissions rate) of *each* bottoming-cycle cogeneration facility *must* be assessed individually on a case-by-case basis (to account for each facility's specific design) in order to determine whether or not it meets the EPS.

The purpose of crediting the thermal energy used in a cogeneration facility is to acknowledge the fact that absent the cogeneration, additional fuel would be needed (and therefore more GHGs generated) to produce both the electricity and other output of the facility. EPUC claims that "If the calciner chose to shut down the bottoming cycle plant (because it could not meet the EPS) there would be no reduction in the industrial site's total emissions" (p. 4, emphasis removed). This conclusion, however, fails to consider the total GHG emissions that would be needed to separately produce the two outputs of a bottoming cycle cogeneration facility. In order to provide the same electricity output of the facility without using the thermal heat generated from the industrial process, additional fuel would have to be used (and more GHGs emitted) to generate that electricity, in addition to the fuel used in the industrial process. The thermal crediting methodology acknowledges this and therefore reduces the GHG emissions rate of the bottoming cycle facility, *for the purpose of determining compliance with the EPS in accordance with SB 1368*, and no other reason.

Using EPUC's example of a hypothetical bottoming cycle unit that produces 35 MW of electricity by capturing waste heat from the calcining of petroleum coke, NRDC provides the following example of how the calculation of the GHG emissions rate of this facility can be performed. To aid in this example, NRDC provides the very simplified diagram of a bottoming-cycle cogeneration facility.

Supplemental
fuel

GHGb

GHGa

Boiler/
turbine

used heat

Fuel → calciner → Heat

kWh

Industrial
product

Waste heat
(vented to
atmosphere)

Numerator

NRDC agrees with EPUC that the numerator of the formula consists of the "total

carbon [dioxide] emitted from the entire calcining facility to produce all of its products,

including calcined coke and electricity" (p. 2-3). NRDC clarifies that this amount of

emissions must take into account both the fuel used to run the calciner, as well as any

supplemental firing used for the electricity generation. In the diagram, the numerator

would be 'GHGa' + 'GHGb'. In EPUC's example, the total emissions of the facility are

606,270,500 lbs.

Denominator

NRDC only partially agrees with EPUC's example of which terms make up the

denominator. NRDC agrees that the first part of the denominator ("KWH

ELECTRICITY") would be 260,610,000 kWh, which takes into account the 35 MW

rated capacity and 85% capacity factor of the plant. In the figure, this first term in the

denominator is represented by 'kWh'.

However, the second term in the denominator ("BTU THERMAL ENERGY

(expressed in kWh") must reflect what is labeled in the figure as 'used heat.' EPUC's

sample calculation assumes that this second term in the denominator is equal to the first

term, i.e., 260,610,000 kWh. This is incorrect, because it ignores the heat rate (or

efficiency with which heat is converted into electricity) of the electricity generation unit.

Assuming that the heat rate is 10,000 Btu/kWh, the 35 MW capacity generation unit with

a capacity factor of 85% requires 2,606,100,000,000 Btu of energy to produce its

electricity. Then, using the 3413 Btu/kWh conversion factor, this is equivalent to 763,580,430 kWh of thermal credit.

GHG emissions rate with thermal credit

Thus, the calculated emissions rate of this facility for the purposes of determining compliance with the EPS is:

$$\frac{606{,}270{,}500 \text{ lbs}}{260{,}610{,}000 \text{ kWh} + 763{,}580{,}430 \text{ kWh}} = 0.592 \text{ lb/kWh or } 592 \text{ lb/MWh}$$
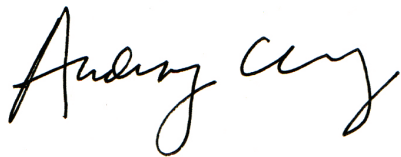
In this example, this facility would meet the EPS of 1100 lb/MWh.

4. Conclusion

The arguments presented in EPUC's petition for modification of D.07-08-009 are without merit, and the thermal crediting methodology can in fact be applied to bottoming-cycle cogeneration facilities as show herein. NRDC respectfully urges the Commission to reject this petition.

Dated: October 26, 2007

Respectfully submitted,

Audrey Chang

Audrey Chang
Staff Scientist

Natural Resources Defense Council
111 Sutter St., 20th Floor
San Francisco, CA 94104
415-875-6100
AChang@nrdc.org

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a copy of the **"Response of the Natural Resources Defense Council (NRDC) to Petition for Modification of D.07-08-009 by the Energy Users and Producers Coalition" in the matter of R.06-04-009** to all known parties of record in this proceeding by delivering a copy via email or by mailing a copy properly addressed with first class postage prepaid.

Executed on October 26, 2007 at San Francisco, California.

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Shari Walker
Natural Resources Defense Council
111 Sutter St., 20th Floor
San Francisco, CA 94104
415-875-6100
Swalker@nrdc.org